U.S. Department
of Transportation

**Federal Aviation
Administration**

Memorandum

Subject: **INFORMATION**: 14 CFR Part 23/CAR 3 Airplanes; Clarification of Type Certification Process of Single Lever Power Controls

Date: DEC 17 1999

From: Manager, Standards Office
Small Airplane Directorate, ACE-110

To: Manager, Anchorage Aircraft Certification Office, ACE-115N
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The purpose of this memorandum is to provide recommendations for certification of single lever power controls (SLPC) installed in Part 23/CAR 3 airplanes. This memorandum supersedes our June 23, 1999 memorandum, which also regarded this subject.

There are airplanes certificated or currently undergoing certification that have combined the features of two or more of the cockpit powerplant controls for power (thrust), propeller (rpm control), and mixture control (condition lever and fuel cutoff for turbine powered airplanes) into a single power lever. The design feature of a SLPC was not envisioned by Part 23/CAR 3. Further, a SLPC cannot meet the standards imposed §§23.777(d) and 23.781(b) as amended by Amendment 23-33. The current amendment level of Part 23 (Amendment 23-53) contains regulations that allow evaluation of a SLPC without the need for Special Conditions (e.g., §§23.777(a)(b), 23.779(b)(1), 23.1309). Since a SLPC was not envisioned at the time Amendment 23-33 was adopted, the question of compliance with §§23.777(d) and 23.781(b) as amended by Amendment 23-33 still exists, however.

Due to recommendations made by the NTSB, Amendment 23-33 provided specific location, height, and shape requirements for a number of cockpit controls, including power, propeller, and mixture controls. With the design feature of a SLPC integrating the functions of multiple controls into a single cockpit control, a nonstandardized design approach for the affected powerplant cockpit controls is used. Additionally, §23.1141(a) states: "Powerplant controls must be located and arranged under §23.777...." However, a SLPC, as described earlier, cannot be arranged in accordance with §23.777; therefore, compliance with §23.1141(a) is not possible.

Notice No. 84-12, which was the basis for Amendment 23-33, described the intent of §§ 23.777 (d) and 23.781 (b). As stated in the notice:

> "An effective means of enhancing pilot experience and training would be to require complete standardization in cockpit design. While such action may initially improve the level of safety, it might ultimately inhibit design advancement and result in lower levels of safety than would have evolved without such a total standardization.
>
> An effective and practical means of enhancing the effectiveness of pilot training and enhancing safety would be to require standardization of location, shape, color, and direction of movement of those cockpit controls. This would have minimal adverse effect on design advancement."

From the preceding, it is obvious that the FAA and industry did not envision or address the future use of a SLPC when drafting this rulemaking, but it was intended to allow design advancements that would enhance safety. A SLPC is a design advancement in the public interest and does not adversely affect safety. Therefore, a SLPC will meet the intent, but not literal compliance of §§23.777(d) and 23.781(b) as amended by Amendment 23-33.

We therefore recommend use of an Equivalent Level of Safety finding for airplanes with a certification basis of Amendment 23-33 or later, when making compliance determinations for §§23.777 (d) and 23.781 (b). For these airplanes, Special Conditions are usually unnecessary. In some cases however, the applicable airworthiness standards may not be adequate due to other novel or unusual features of the aircraft and Special Conditions may be warranted.

For airplanes with a certification basis prior to Amendment 23-33, no special considerations will be needed unless they involve other novel or unusual design features not covered by the applicable regulations.

The recommendations made in this memorandum differ from how some Part 23/CAR 3 projects have been processed in the past. This new policy does not apply to certification projects that have begun prior to the date of this memorandum.

We have initiated regulatory action to revise Part 23 to allow incorporation of a SLPC without special considerations. However, until these actions have been completed, the recommendations in this memorandum may be used for certification of a SLPC on Part 23/CAR 3 airplanes.

If you have any other questions or need additional information, please contact Mr. Randy Griffith, Regulations and Policy Branch, at 816-329-4126.

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